(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 162 659 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
06.12.2017 Bulletin 2017/49

(43) Date of publication A2:
03.05.2017 Bulletin 2017/18

(21) Application number: **16196309.5**

(22) Date of filing: **28.10.2016**

(51) Int Cl.:
B62D 5/00 *(2006.01)* ***B62D 6/00*** *(2006.01)*

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **02.11.2015 JP 2015215942**

(71) Applicant: **JTEKT Corporation**
Chuo-ku, Osaka-shi
Osaka 542-8502 (JP)

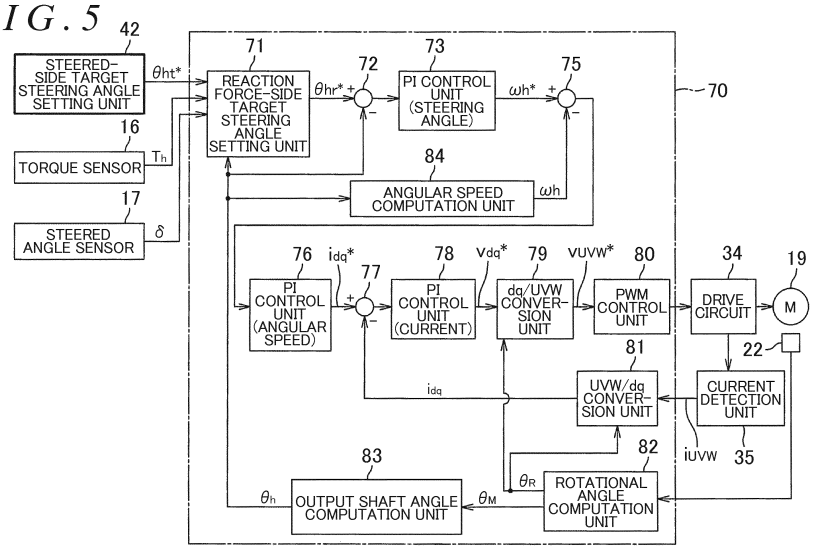
(72) Inventors:
- **SAKAMAKI, Masahiko**
  Osaka-shi, Osaka 542-8502 (JP)
- **IZUTANI, Keisuke**
  Osaka-shi, Osaka 542-8502 (JP)

(74) Representative: **Winter, Brandl, Fürniss, Hübner, Röss, Kaiser, Polte - Partnerschaft mbB**
Patent- und Rechtsanwaltskanzlei
Alois-Steinecker-Strasse 22
85354 Freising (DE)

(54) VEHICLE STEERING DEVICE

(57) A vehicle steering device, in which a steering member and a steering operation mechanism are not mechanically coupled, includes a reaction force motor (19) that applies a reaction force to the steering member, and a reaction force motor control unit (70) that controls the reaction force motor. The reaction force motor control unit (70) includes a target rotational angle setter (71) that sets a target rotational angle for an output shaft at a position close to the side of the neutral position of the output shaft with respect to the rotational angle of the output shaft corresponding to a steered angle limit value by a rotational angle matching steering torque detected by a torque sensor (16) when a steered angle has reached the steered angle limit value and the steering torque that is larger than the steering torque at the time when the steered angle limit value was reached is applied to a steering wheel.

FIG. 5



EP 3 162 659 A3

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 16 19 6309

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 1 407 959 A2 (TOYODA MACHINE WORKS LTD [JP]) 14 April 2004 (2004-04-14) * paragraphs [0043] - [0050]; figures 3,4 * -----	1	INV. B62D5/00 B62D6/00

TECHNICAL FIELDS SEARCHED (IPC)

B62D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	26 October 2017	Kulozik, Ehrenfried

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 19 6309

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

26-10-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1407959 A2	14-04-2004	DE 60307756 T2	13-09-2007
		EP 1407959 A2	14-04-2004
		JP 3908144 B2	25-04-2007
		JP 2004130971 A	30-04-2004
		US 2004104066 A1	03-06-2004

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82